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How important is personality in the selection of medical school students?

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ABSTRACT

Admittance to medical school has traditionally been determined on the basis of students' performance on the Medical College Admission Test (MCAT) and grade point average (GPA), which assess cognitive abilities. To supplement these predictors, medical schools also consider a semi-structured interview, which assesses non-cognitive attributes. Successful performance as a medical student is determined by performance in courses and clinical rotations. The traditional cognitive predictors generally contribute to the prediction of course requirements. However, these traditional predictors often demonstrate weak relations with clinical performance, suggesting that other predictors are necessary. Using approximately 300 medical students, the current study investigated a) the ability of the traditional admission tools to predict course and clinical performance, and b) the incremental validity of personality predictors, which were chosen on the basis of a personality-oriented job analysis. The traditional predictors accounted for a significant proportion of variance in course performance, with personality accounting for incremental variance. Clinical performance was only predicted by personality and the traditional predictors did not demonstrate predictive validity.

1. Introduction

Annually, medical school admission committees must decide which applicants should be accepted. Admission committees attempt to select candidates who will: a) successfully complete the requirements of the medical school curriculum, and b) become successful physicians. Thus, it is critical to evaluate whether the assessments used in selection can predict both aspects of medical school performance. As such, the current research is focused on comparing the validity of the traditional cognitive predictors (i.e., Medical College Admission Test [MCAT], grade point average [GPA], and face-to-face interview) versus several non-cognitive personality predictors that were chosen via Goffin et al.'s (2011) personality-oriented job analysis (POJA). The main contribution of this research, as compared to Goffin et al., is that the current study focused on whether personality traits would predict the clinical and academic course performance of medical students over and above that of traditional predictors. Goffin et al., on the other hand, focused specifically on testing a methodology for determining which personality traits may best predict performance in a given job. Thus, the main contributions of the current study and that of Goffin et al. are distinctly different.

Recent research has differentiated the cognitive and non-cognitive components of physicians' performance, and thereby underscored the importance of personality as a predictor of performance (Hojat, Erdmann, & Gonnella, 2013; Lievens, Ones, & Dilchert, 2009). Our goal is to add to this literature by examining the incremental validity of several personality traits, and examining the relations between traditional predictors, personality, and the academic and clinical performance of medical students. Traditional predictors are considered MCAT scores, GPA, and scores on a semi-structured panel interview.

1.1. Personality and medical school performance

Lievens et al. (2009) explored the relations between the five-factor model of personality (FFM; neuroticism, extraversion, openness to experience, agreeableness, conscientiousness) and GPA in medical school. The FFM demonstrated significant relations with GPA (rs = |0.01–0.18|, $R^2 = 0.05$), with conscientiousness being the strongest predictor ($r = 0.18$). Lievens et al. also found that the validities associated with the FFM increased over time, such that students' scores were stronger predictors of later GPA (Year 7) than early GPA (Year 1). However,

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Lievens et al. documented a number of stronger relations between narrower, facet-level personality traits and performance. For example, self-discipline, a facet of conscientiousness, demonstrated $r = 0.22$. Using all thirty narrow facets in selection and prediction would likely be too onerous for selection professionals, and thus a systematic way of selecting a more efficient set of traits is needed.

The use of broad traits, without appropriate linkages to behavioral criteria of interest is also reflected in the work of Helle, Nivala, Kronqvist, Ericsson, and Lehtinen (2010), among others. As an example, Helle et al. found that conscientiousness and openness to experience added to the prediction of grades in one medical school course (pathology). Although investigating the relation between broad FFM traits and medical student performance has been valuable, this is often done with little or no justification for choosing these traits, suggesting the use of atheoretical, exploratory approaches. Tett, Jackson, and Rothstein (1991) found that the lack of theoretically supported linkages between traits and performance criteria may downwardly bias the magnitude of observed relations. To contribute to the knowledge available on the relations between personality and medical student performance, the current study used a POJA to develop job relevance ratings of each personality trait. The POJA process facilitates a theoretically supported, confirmatory approach to the investigation of personality-performance relations.

Additionally, the current study aimed to examine the relations between personality and the multidimensional nature of medical school performance, that is, course performance and clerkship performance. Whereas, Helle et al. (2010) only examined relations between the FFM and performance in one academic course, Borges and Savickas (2002) advocated for the performance of medical profession as consisting technical competence and contextual competence (we discuss this difference in further detail below). Therefore, to better acknowledge the multidimensional nature of medical student performance we examined relations between personality traits chosen via a POJA and course performance (i.e., technical competence) as well as clerkship performance (i.e., contextual competence).

1.2. Personality-oriented job analysis

The issue of broad versus narrow personality predictors is far from clear-cut (see Ashton, Paunonen, & Lee, 2014). In particular, factor- or facet-level predictors may have stronger or weaker relations with important criteria depending on the theoretical linkages (Rothstein & Jelley, 2003). To determine appropriate, theoretically-supported linkages, and to align broad *and* narrow personality traits with various performance criteria research has highlighted applications of POJA (Cucina, Vasilopoulos, & Sehgal, 2005; Goffin et al., 2011; O'Neill, Goffin, & Rothstein, 2013; O'Neill, Goffin, & Tett, 2009; Raymark, Schmit, & Guion, 1997; Sümer, Sümer, Demirutku, & Çifci, 2001; however see issues raised by McLarnon, Goffin, Schneider, & Johnston, 2016). POJA allows users to examine the predictive validity of personality traits chosen by job experts on the basis of the traits' importance for performing a job's tasks.

We used Goffin et al.'s (2011) study as a springboard by investigating the incremental role of specifically-chosen personality traits over traditional predictors of medical school performance. Thus, we used the same sample of medical students as Goffin et al., but went beyond Goffin et al. by examining the incremental validity of POJA-chosen traits over and above MCAT, GPA, and interview scores. We expand on the POJA procedure in the Methods section, and readers are referred to Goffin et al. for further details.

1.3. Medical school performance criteria

Medical school performance typically consists of academic performance (AP), based on courses taken in the first years of the program, and ratings of clinical performance (CP) during a series of clerkships in the latter years of the program (Albanese, Snow, Skochelak, Huggett, & Farrell, 2003; Hojat et al., 2013; Powis, 1994). Although Lievens et al. (2009) did not assess these two criteria separately, they denoted the difference in personality validities across years in medical school, with higher validity in the latter years when students are involved in the clerkship rotations. We investigated the incremental role of POJA traits over and above traditional medical school predictors across both AP and CP.

1.4. Hypotheses

Based on the accumulated literature (e.g., Julian, 2005), we first proposed the following hypothesis:

Hypothesis 1. Traditional medical school admission predictors (i.e., MCAT, GPA, and interview) will provide significant prediction of a) AP, and b) CP.

Second, we assessed whether several personality attributes, specifically chosen by a POJA (see Goffin et al., 2011), accounted for incremental prediction of AP and CP:

Hypothesis 2. Personality traits chosen via POJA will account for incremental variance in a) AP, and b) CP over and above traditional medical school admission predictors.

Ultimately, this work assesses whether personality traits may contribute to the success of physicians, potentially enabling medical schools to supplement the traditional predictors of medical school performance.

2. Method

2.1. Participants and procedure

Our sample comprised 330 MD candidates (59.1% female, 2.7% undeclared), with an average age of 25.00 years ($SD = 2.05$), from a large North American medical school. Participants volunteered for the study during Year 3 of the MD program, which consisted of six clinical rotations of approximately six weeks each: Family Medicine, Internal Medicine, Obstetrics, Pediatrics, Psychiatry, and Surgery. Participants completed the personality measures before the start of the clinical rotations, and were evaluated in each rotation by the respective supervising physician using the CP measure described below. All participants completed the traditional evaluations prior to beginning medical school, and they completed 11 courses in their first two years of study, which provided a measure of AP. Four cohorts of MD candidates were recruited in order to provide sufficient sample size. Due to missing data on the traditional predictors, listwise deletion resulted in retaining data from 297 individuals.

2.2. Materials

2.2.1. Traditional predictors

The MCAT (AAMC, 1991) consists of four subtests: verbal reasoning, physical sciences, biological sciences, and writing. The validity of the MCAT has been established in previous research (Julian, 2005; Mitchell, Haynes, & Koenig, 1994).

As is typically done (McGaghie, 2002), the average GPA of the participants' best two years of undergraduate study served as a measure of GPA.

Candidates were also assessed via a semi-structured, three-person, panel interview. Interviews are used for selection by the vast majority of medical schools. The interview was designed to assess a variety of attributes related to suitability for medical school (e.g., maturity, communication skills). Each interviewer scored the candidate on a 0–100 scale, and an average of the three scores was taken (ICC[2,k] = 0.94).